

USE OF ICT TECHNOLOGIES AND FACTORS AFFECTING PRE-SERVICE ELT TEACHERS' PERCEIVED ICT SELF-EFFICACY

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ABSTRACT

This study aims to identify both level and frequency of ICT technology use and factors affecting perceived self-efficacy levels of pre-service English Language Teaching (ELT) teachers' (n=241) ICT self-efficacy. The data were collected through a survey (Çuhadar & Yücel, 2010) during the 2011-2012 academic year that includes items on the use and frequency of ICT technologies along with three open-ended questions. The responses were analyzed in frequency and percentages using descriptive statistics within the framework of Technology Acceptance Model (TAM) based on Social Cognitive Theory and the content analysis technique. It could be concluded that majority of the pre-service ELT teachers find themselves self-efficacious in the use of ICT. Results further suggest that the perceived use of computers, experience and confidence play significant role while lack of knowledge and skills, technical problems and lack of confidence negatively influence ICT self-efficacy.

INTRODUCTION

The need, nowadays sometimes *the pressure*, to prioritize teaching with technology considering teachers' level of preparedness has become more demanding due to the rapid advancements in the educational use of technology. This need has been extensively emphasized in a variety of contexts (Albion, 1999; Chen, 2008). Nonetheless, numerous teachers' use of technology still has not extended over emails and search engines (Chen, 2008; Ertmer & Ottenbreit-Leftwich, 2010; Jimoyiannis & Komis, 2007; Markauskaite, 2007; Tezci, 2009; Tondeur, van Braak, Sang, Voogt, Fisser & Ottenbreit-Leftwich, 2012) albeit the excessive number and variety of Web 2.0 tools.

First, and most importantly, Bandura's (1999:2) definition of self-efficacy (SE) as "beliefs in one's capabilities to organize and execute the courses of action required managing prospective situations." sketches the effects of one's actions for the time being and later. Thus, within the context of social cognitive theory, as Bandura later (2006:4) stated SE is an asset to "self-development, successful adaptation and change" that influences either directly or indirectly goals, motivation and determination to cope with difficulties. In the educational settings, along with the recent changes in the roles of actors in education, students have become stronger in the way they control their learning process by self-directed learning including through the Internet. Essentially, teachers' level of SE directly influences the pedagogical outcomes. Friedman and Kass (2002) updated the teacher self-efficacy definition by combining classroom and organizational efficacy in that:

"teacher's perception of his or her ability to (a) perform required professional tasks and to regulate relations involved in the process of teaching and educating students and (b) perform organizational tasks, become part of the organization and its political and social processes." (p. 684).

Research on SE has explicitly addressed its impact on technology use such as Albion (1999) considered teachers' SE beliefs as one of the leading factors affecting the success of technology integration. Perceived beliefs of teachers regarding technology are significant; they are likely to determine the use of technology and related decisions and teacher behavior in the classroom (Sang, Valcke, van Braak & Tondeur, 2010).

In the Turkish context, a plethora of research (Akkoyunlu & Kurbanoglu, 2003; Çelik & Yeşilyurt, 2013; Demiralay & Karadeniz 2010; Deryakulu, Buyukozturk, Karadeniz & Olkun, 2008; Korkut & Akkoyunlu, 2008; Tezci, 2009; Topkaya, 2010; Usluel, 2007) in relation to ICT attitudes and self-efficacy are available; mostly, the studies reveal similar findings such in Çelik and Yeşilyurt (2013) featuring attitudes to technology, perceived computer SE and computer anxiety as predictors of effective computer-assisted education. In a more general sense, Deryakulu, Buyukozturk, Karadeniz and Olkun (2008) outlined the positive and negative factors during the ICT implementation process. Furthermore, Tezci (2009) analyzed the effect of teachers on ICT use in education and concluded that ICT use among teachers in Turkey is low and limited to the Internet, email, word processing and some educational CDs. Teachers with previous experience and higher levels of knowledge and

attitude are likely to exert the ICT tools. Similarly, Demiralay and Karadeniz (2010) analyzed the effect of ICT on elementary pre-service teachers' perceived literacy SE and pre-service teachers' computer experience, skills and frequency of computer and internet use, access opportunities to computer and internet were found to be leading influencing factors. With pre-service primary education teachers, Usluel (2007) identified the level and duration of ICT usage as primary factors having an impact on the information literacy SE. Besides, Akkoyunlu and Kurbanoglu (2003) explored the relation between pre-service teachers' perceived information literacy SE and perceived computer SE and found a positive correlation with varying degrees of change over the years. Korkut and Akkoyunlu (2008) investigating the foreign language pre-service teachers' information and computer literacy perceived SE, announced a high level of abovementioned SE types and a positive inter-relation. Correspondingly, Topkaya (2010) revealed a positive correlation between computer and general SE focusing on the pre-service English language teachers.

Theoretical background to this study is based on Social Cognitive Theory as outlined by Bandura (2001:10) in relation to perceived self-efficacy placing it as the major key agent in the adaptation and change, positive or negative inclination of thought and "self-regulation of motivation through goal challenges and outcome expectations". By this means, SE not only influences types of activities to be engaged in but also selection of behaviors that leads to a direction in personal development. A complementary model to refer is Technology Acceptance Model (TAM) developed by Davis (1986) that guides in explaining and predicating behaviors of ICT users as an extended version of the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980, as cited in Park, 2009: 151). TAM with its dimensions of perceived usefulness, perceived ease of use, attitude towards, behavioral intention to use, external variable and actual use, has been referred and confirmed by numerous research (Dillon & Morris, 1996; Park, 2009; Silva & Dias, 2007; Yuen & Ma, 2008). In line with the model, this study intends to deduce a blend of perceived usefulness of ICT technologies, attitudes to technology use for education, affecting variables and further intentions of use by eliciting responses from the participants through analysis of their statements.

What is commonly stated in the aforementioned studies puts the teachers in the center for the successful integration of technology. Therefore, teachers needed to be instructed and trained during their pre-service training and regarding this fact this study highly values the pre-service teachers' insights about ICT. All in all, this study considers the factors affecting pre-service teachers ICT SE to frame their preparedness for ICT integration to their own teaching context.

THE STUDY

Self-efficacy levels of teachers play a significant role on the effectiveness of teaching pedagogy; as for the SE for the educational use of information and communication technologies (ICT), technology integration to education can be traced at the very least from the teacher perspective. Given its place in language teaching, this study aims to identify self-efficacy levels of pre-service English Language Teaching (ELT) students for educational use of ICT. According to Jimoyiannis and Komis (2007), among the secondary teachers of different subject, English teachers did not effectively integrated ICT and resisted to a great extent to accept ICT as a pedagogical tool. Bearing in mind these findings, the focus is the self-perception of participants' ICT use self-efficacy, besides the positively and negatively perceived factors affecting ICT integration to education. Within this framework, this study seeks answers to the following questions:

1. What are the ELT students' ICT technology frequency and use levels?
2. How do ELT students perceive themselves about their ICT SE?
3. What are the positive factors affecting perceived ICT SE levels of ELT students?
4. What are the negative factors affecting perceived ICT SE levels of ELT students?

The findings of this study need to be interpreted regarding its limitations; the research is limited to the number of students in a program of Faculty of Education, properties of the location (geographical as well as educational) and single location (one state university) and timing of the application. One final restriction is the blistering and non-stop technological developments in that the list of ICT technologies could have included some social network websites and tools used for educational purposes.

In the present study survey method was used (Karasar, 1991:77) as the pre-service ELT teachers' self-perceptions' of ICT use efficacy and the positive and negative perceived factors affecting ICT integration to education were examined.

PARTICIPANTS

Pre-service ELT students (n=241) formed the study group which consisted of 195 female and 46 male

participants during the 2011-2012 academic year. Age range of the students is between 19 and 26. The number of students according to their year of study is as follows: 74 first year, 91 second year, 51 third year and 25 fourth year students. The study group is composed of the students available at the time of survey implementation in the classroom; thus, the whole group was treated as the study group. The survey was administered in Turkish for better comprehension of the items and expression to the responses despite the presumably high English proficiency level of students. The ICT background of the participants, though could vary in a wide range, includes the ICT course offered starting from fourth grade of primary education. Nonetheless, as of 2007-2008 school year, Board of Education (Talim Terbiye Kurulu Başkanlığı – TTKB) in Turkey extended the duration of ICT course to the first eight years of compulsory education (TTKB, 2006). Moreover, students during secondary education most probably have used computers at least for personal uses. When the current undergraduate pre-service ELT program is examined, it is seen that during the training of pre-service ELT teachers at Educational Faculties in Turkey, *Computer I and II (1st grade)*, *Instructional Technologies and Materials Design (ITMD)* (2nd grade), *Language Teaching Materials Adaptation and Development* (4th grade) courses are offered as compulsory courses and *Computer-Assisted Language Learning (CALL)* course is offered during the last year of study as an optional course as stated by the Council of Higher Education (Yüksek Öğretim Kurulu Başkanlığı – YÖK, 2007). When the previous undergraduate education faculty programme is examined, it is seen that Instructional Technologies and Materials Development (ITMD) course was offered to pre-service ELT teachers instead of Instructional Technologies and Materials Design (ITMD) in their second year at their training (YÖK, 1998).

DATA COLLECTION INSTRUMENT AND ANALYSIS

Within this context, the study followed mixed approach using both quantitative and qualitative research design by administering a survey originally developed by Çuhadar and Yücel (2010) that is composed of three parts. Part I with six questions aims to identify basic information about the participants (i.e. age, gender, internet access and frequency of use), Part II includes a list of computer and hardware products (15 items) along with software and communication services (13 items) to uncover the participants' level and frequency of ICT technologies use. In Part III, three open-ended questions directed to gather detailed reflection are as follows:

1. As a prospective foreign language teacher, do you think you have ICT self-efficacy?
2. What factors have positively influenced your ICT self-efficacy beliefs during your undergraduate studies?
3. What factors have negatively influenced your ICT self-efficacy beliefs during your undergraduate studies?

Responses for each grade were collected, typed, listed and categorized following the content analysis technique (Yıldırım & Şimşek, 2008) as was carried out by Çuhadar and Yücel (2010). For a reliable categorization process, the two researchers were both worked on grouping the statements and naming the categories. On the other hand, the use level and frequency of ICT technologies were analyzed through descriptive statistics; in other words, calculating percentage and frequency values. Furthermore, the participants have been listed and coded in numbers; for instance, referring to the student numbered 22 as S22 in short as Çuhadar and Yücel (2010) did.

FINDINGS

Responses to the survey and open-ended questions are organized and displayed in tables to underpin participants' ICT technology frequency and level of use as well as to uncover the underlying the reasons. To begin with, Table 1 demonstrates participants' ICT technology frequency and level of use concentrating on computer and hardware products in frequency and percentages.

Table 1. ELT students' frequency and level of computer and hardware products use

Computer and Hardware Products	Frequency of use						Level of use					
	Often			Sometimes			Never			Can use		
	f	%		f	%		f	%		f	%	
PC	94	42		111	50		19	8		206	99	
PDA (pocket PC)	21	10		43	20		149	70		140	69	
Notebook	200	86		28	12		4	2		209	100	
Mobile phone	225	97		5	2		3	1		206	100	
CD/DVD writer	97	43		110	48		21	9		183	88	

Flash drive	219	92	18	8	1	0	203	98	4	2	0	0
Printer	58	26	119	52	50	22	157	76	37	18	14	6
Scanner	25	11	98	44	99	45	100	48	74	35	37	17
Webcam	79	34	127	56	23	10	191	93	10	5	4	2
DVD player	119	52	91	40	20	8	192	92	15	7	2	1
Digital camera	138	59	79	34	16	7	201	95	8	4	2	1
MP3 player	167	71	44	19	23	10	206	99	2	1	0	0
Voice recorder	34	15	118	53	71	32	183	87	20	10	7	3
Video camera	82	37	115	51	27	12	188	90	20	9	2	1
E-dictionary	87	38	77	34	63	28	193	92	80	5	92	3

It is clearly understood that mobile phones (97%) are the foremost device to be used while flash drive (92%) and notebook (86%) use is quite at the high frequencies. Additionally, the level of use for mobile phones and notebook is 100% and 98% for the flash drive. The least frequently and commonly used technologies are PDA (10%), scanner (11%) and voice recorder (15%) among which scanner (48%) has the lowest level of use. It is interesting to note that the frequency of notebook (86%) use doubles that of PCs (42%); on the other hand, as a language learning tool, e-dictionary is used frequently only by the 38 percent of the participants.

Table 2 lists software and services of communication used by the participants outlining their frequency and level of use. This table aims to display ICT technologies that are also commonly practiced for educational purposes.

Table 2. ELT students' frequency and level of software and services of communication use

Software and Services of Communication	Frequency of use								Level of use			
	Often		Sometimes		Never		Can use		Can use with the help of others		Cannot use	
	f	%	f	%	f	%	f	%	f	%	f	%
Educational programs	106	48	102	46	13	6	177	86	23	11	5	3
Word processing programs (Eg. Word)	191	82	42	18	2	0	198	97	8	3	0	0
Spreadsheets (Eg. Excel)	33	14	138	61	57	25	137	66	59	28	12	6
Presentation program (Eg. PowerPoint)	184	78	48	20	3	2	196	95	9	4	1	1
Music programs (Eg. Winamp)	203	88	24	10	5	2	203	98	3	1	1	1
Video player program (Eg. Windows Media Player)	213	91	21	9	1	0	205	100	0	0	0	0
Web browser (Eg. Internet Explorer)	214	92	14	6	6	2	201	96	6	3	2	1
E-mail program (Eg. Outlook)	74	33	76	34	73	33	148	72	34	16	25	12
Chat program (Eg. MSN)	168	72	58	25	8	3	204	98	3	2	0	0
E-mail groups (Eg. Yahoo Groups)	72	32	68	30	85	38	158	79	29	14	14	7
Web-based forum	48	21	99	44	77	35	136	68	39	19	25	13
Blog (Weblog)	41	18	106	47	79	35	140	70	44	22	15	8
SMS	217	92	18	8	2	0	201	99	3	1	0	0

The most commonly used ICT technologies displayed in Table 2 are web browsers (92%), SMS (92%), video player programs (91%) and music programs (88%). Spreadsheets (14%), blogs (18%) and forums (21%), respectively, are listed as the least frequently used ones; at the same time, the level of use for these technologies are high with blogs (70%) as the least self-used one. Nevertheless, frequent use of emails has been expressed only by the 33% of the participants.

The following tables will report the responses to the three open ended questions. Pre-service ELT student responses to the first question "As a prospective foreign language teacher, do you think you have self-efficacy

for using ICT for educational purposes?” were analyzed in two categories: Competence and Incompetence. For competency, seven; conversely, for incompetency five main reasons emerged as illustrated in Table 3.

Table 3. ELT students’ ICT SE and their reasons

Reasons		1 st (n=74)		2 nd (n=91)		3 rd (n=51)		4 th (n=25)	
		f	%	f	%	f	%	f	%
Competence	I can use ICT for educational purposes (research, assignments, presentations).	14	40	10	13.70	14	56	4	21.05
	ELT requires me to use ICT.	5	14.29	11	15.07	1	4	-	-
	I know how to use ICT successfully.	6	17.14	19	26.03	4	16	3	15.79
	I am eager to use ICT and keep myself updated.	3	8.57	10	13.70	4	16	5	26.32
	I can use ICT for personal use (videos, communication).	7	20	11	15.07	2	8	-	-
	I enrolled in the ICT course last year.	-	-	12	16.44	-	-	-	-
	CALL course has improved my ICT skills.	-	-	-	-	-	-	7	36.84
Total		35	100	73	100	25	100	19	100
Incompetence	Teachers do not provide enough guidance (eg. website addresses).	2	10	3	12.5	1	10	-	-
	I do not have enough information and skills.	10	50	14	58.33	3	30	4	100
	I do not use it for educational purposes.	6	30	-	-	2	20	-	-
	I have limited Internet access.	2	10	3	12.5	3	30	-	-
	I cannot keep myself updated.	-	-	4	16.67	1	10	-	-
Total		20	100	24	100	10	100	4	100

Students seem to have an awareness of using ICT in language teaching and learning. In general, students of all grades expressed their competence in ICT use while fewer voiced some concerns and insufficiencies as their incompetence. Given the frequency of reasons per grade, it is observed that first graders believe they “can use” ICT for both educational and personal uses while they know to conduct the ICT operations successfully. Second graders reported knowing how to use ICT successfully; additionally emphasized the significant role of the compulsory ICT course they had enrolled the previous year. On the other hand, third graders ranked “educational use of ICT” top among the reasons followed by knowing how to use it. What is thought-provoking in the fourth graders’ statements is the effect of CALL course and the distinctive increase in their eagerness to use ICT as opposed to other grades.

More specifically, some second year students (S102, S146) linked their self-confidence in their use of ICT to their interest in the newest and up-to-date tools. As for the educational use, integrating visual aids was emphasized in addition to using ICT to practice pronunciation and to aid as an e-dictionary. Nonetheless, third grade students (S171, S 188 and S192) attributed access to and use of online databases and material development as the educational uses of ICT in practice. Lastly, to fourth graders CALL course has created a feeling that they would be confident in their future profession in integrating ICT to their classes. Here, neither ICT course offered in the first year nor the personal use of ICT was mentioned. Instead, students about to graduate started showing more eagerness to ICT use. Moreover, several (S222, S234) conveyed how they could manage to succeed using ICT by trial and error attempts.

Answers to the second question “What factors have positively influenced your self-efficacy beliefs about the educational use of ICT during your undergraduate studies?” were listed and ranked that included 17 reasons identified as positive contributors (see Table 4).

Table 4. Positive factors influencing ELT students’ ICT SE

Positive factors	1 st (n=74)		2 nd (n=91)		3 rd (n=51)		4 th (n=25)	
	f	%	f	%	f	%	f	%
I can manage to use ICT on my own.	4	8.89	1	0.93	-	-	-	-
I get positive feedback and support from my teachers.	3	6.67	-	-	2	2.90	-	-
I can use ICT for my courses.	13	28.89	34	31.78	22	31.88	11	31.43
I am/get experienced in the use of ICT.	6	13.33	21	19.63	9	13.04	1	2.86
I can access information instantly & save time.	5	11.11	4	3.74	5	7.25	1	2.86
Computer Literacy course	5	11.11	4	3.74	2	2.90	5	14.29

ITMD course	-	0.00	12	11.21	-	-	1	2.86
My self-confidence increases.	5	11.11	12	11.21	6	8.70	3	8.57
My language skills (listening) improve.	1	2.22	2	1.87	1	1.45	-	-
Availability of ICT facilities/tools	1	2.22	1	0.93	1	1.45	1	2.86
Awareness for the importance of ICT use in teaching	2	4.44	1	0.93	2	2.90	4	11.43
My interest and enjoyment increase.	-	-	7	6.54	4	5.80	2	5.71
ICT change the learning environment (visuality, rich sources, meaningful learning)	-	-	8	7.48	10	14.49	-	-
I get more motivated.	-	-	-	-	3	4.35	1	2.86
ICT enables individualized learning.	-	-	-	-	1	1.45	-	-
ICT enables communication among students.	-	-	-	-	1	1.45	-	-
CALL course	-	-	-	-	-	-	5	14.29
Total	45	100	107	100	69	100	35	100

The most commonly stated leading reason is determined as “I can use ICT for my courses.” for all grades. The ranking for the initial three reasons “I can use ICT for my courses.”, “I am/get experienced in the use of ICT.” and “My self-confidence increases.” is the same for the first and second year students. Accordingly, a first grader wrote down “I am aware of my skills in technology use.” Several students mentioned that “knowing that I will be a teacher, I am aware of the need to use technology for my profession.” First year students see “Computer Literacy” course as a contributor while second year students consider ITMD (Instructional Technology and Material Development) course a positive factor. As an example, S3, a first year student listed “happiness of completing the assignments on her own, encouraging herself to perform by reminding herself that she can do and she did it, and positive feedback from the teachers” as positive contributors. Besides, CALL (Computer Assisted Language Learning) course was perceived to have positive influence for the course participant fourth year students. To name a few more of the positive factors, students believe that their language skills, specifically, listening skills will improve with the help of ICT tools; in the meantime, they will be more confident, motivated and interested.

Students (S22, S45) identified an overall positive impact on their learning process. One of the first year students (S3) expressed his/her confidence that shows the courage needed to make the utmost use of ICT by stating “I can do it, I did it.” In line with their undergraduate courses, first graders (S14) indicate the benefit of ICT in the form of online dictionaries that help get prepared for the “Composition” course.

Though the leading reasons are similar to those of first graders, second year students differentiated themselves by pointing out the impact of ITMD course. Moreover, properties such as time-saving and instantly accessible have been merged into practical use of ICT. Increase is not only observed in self-confidence but also in interest and enjoyment. What has been meant by “experience” was clarified as the Computer Literacy course, private ICT courses, and being computer literate since childhood. Positive factors of “effective presentation skills through ICT” and “positive ICT-related peer feedback” stated by a second year student (S85). Third year students explained how they could use ICT for my courses including way of doing research and preparing for courses. Another popular issue was the teachers’ guidance and feedback indicated by first and third graders and not to be mentioned by the rest. Only third and fourth year students seem to have realized the importance of speed of developments in the internet and felt somehow left behind.

Last of all, there were not as many responses to the third question as in the previous ones. The question posed was: “What factors have negatively influenced your self-efficacy beliefs about the educational use of ICT during your undergraduate studies? Majority of students left this question blank and only 12 general statements could be listed (see Table 5).

Table 5. Negative factors influencing pre-service ELT students’ ICT SE

Negative factors	1 st		2 nd		3 rd		4 th	
	(n=74)		(n=91)		(n=51)		(n=25)	
	f	%	f	%	f	%	f	%
Insufficient guidance	3	12.5	-	-	-	-	-	-
Lack of technological tools	5	20.83	3	6.67	3	8.57	3	21.43
Time consuming	3	12.5	2	4.44	2	5.71	-	-

Technical problems	3	12.5	10	22.22	7	20	2	14.29
Lack of knowledge & skills	9	37.5	9	20.00	12	34.29	5	35.71
Reluctance	1	4.17	-	-	-	-	-	-
Information access problems	-	-	8	17.78	1	2.86	-	-
Excessive use of ICT in courses	-	-	1	2.22	1	2.86	-	-
Lack of interest	-	-	1	2.22	4	11.43	-	-
Insufficient access to ICT in class	-	-	-	-	2	5.71	-	-
Insufficient access to Internet	-	-	-	-	-	-	1	7.14
Lack of confidence	-	-	11	24.44	3	8.57	3	21.43
Total	24	100	45	100	35	100	14	100

Negative factors could be grouped as insufficiencies and challenges. Precisely, insufficiencies are of guidance, technological tools, knowledge and skills, interest, confidence, access to ICT and Internet. Likewise, challenges are of technical or accessibility origin. Most commonly stated negative point is “lack of knowledge and skills” with a lessening degree among grades; nevertheless, it peaked during the third year. Furthermore, majority of the respondents reported “having difficulty in using Microsoft Excel program” which is described as “Fear of Excel” by a third year student. It is necessary to remind here that spreadsheets were reported to have been used least (14%) with a level of use of 66 percent. One of the first year students (S12) voiced the complaint about teachers’ constant criticism. Another student (third grade, S202) stated the Internet problems as coming across unrelated and untrusted resources. This factor is followed by the technical problems some of which were stated as hardware (lack of) and software problems, breakdowns during presentations and issues regarding Internet connection. An interesting statement is “There are no problems at present.” signaling the probability of any such incident.

Table 3 displays that first year students have not stated any lack of confidence and interest or access. Main trouble for them seems to be their inexperience and availability of technological tools. Besides, second grade students peaked in lack of confidence and technical problems. Several of them (S82, S107, and S149) explicitly correlated lack of confidence to anxiety and fear of making mistakes that would cause either technical problems or data loss. Another identified technical problem is the websites that do not work properly. It is the third grade students who felt the lack of knowledge and skills most. Apart from this, since the classes are crowded, there is not sufficient access of ICT that is closely linked to access to information. Last but not the least, fourth grade students seem to be the least negative group and they are the only group pointing out the access problems to Internet.

DISCUSSION

Outnumbering reasons for competence and positive factors could suggest that majority of pre-service ELT students have high levels of ICT self-efficacy. It could be explained with reference to the related literature. First of all, the study by Demiralay and Karadeniz (2010) resulted in the positive effect of computer use experience, level of computer use skills, frequency of use and access (both computers and Internet) on the student teachers’ perceived information literacy SE. Accordingly, the participants in this study indicated the place of experience, knowledge of skills and access while singling out educational need to use ICT skills. The study by Deryakulu et al., (2008) might help to visualize how perceptions might mis/match to the practice.

Findings in this study support the aforementioned literature. In general terms, both positive and negative factors are likely to be observed for pre-service teachers. For instance, “dynamic nature of ICT” from the ICT teachers’ perceptive (Deryakulu et al., 2008) and affirmative influence of ICT on the nature of teaching and learning (Jimoyiannis & Komis, 2007) seem to match one of the positive remarks in this study about ICT integration spicing up the environment with visuals and variety of sources as well as “student interest” reported in both studies.

For the first three positive factors influencing the ICT SE, the leading is “I can use ICT for my courses” displaying the awareness of pre-servicers about the practical use of ICT in language classes. “Perceived usefulness and ease of use” (Davis, 1989) are strong determinants to envisage one’s intention of computer use (Ma, Andersson & Streith, 2005: 388). Furthermore, Martinovic and Zhang (2012: 467) pointed out the importance of “perceived importance of ICT” as a motivational factor. Unlike the findings of the study Jimoyiannis and Komis (2007) in which teachers feel more reasons and real experiences to be convinced about the educational use of ICT tools, participants in this study ranked the capacity to use ICT for educational purposes at the top. This could be explained as in five years, ICT might have become more pivotal and essential

even for pre-service teachers. Another difference between pre and in-service teachers that could be inferred from the aforementioned studies is in addition to awareness, in-service teachers are skeptical about the benefits of ICT.

Secondly, “I am/get experienced in the use of ICT.” Though personal use of ICT does not always lead to its transfer to professional setting as contrary to the hypothesis of So, Choi, Lim and Xiong (2012) that inferred no direct effect of personal computer use on the prospective use, computer use experience could be a strong determinant of its application. Previous experience has been seen to increase the levels of computer use (Tezci, 2009); teachers with computer use experience are considered to have positive attitude and higher levels of knowledge those in line with enhanced ICT SE. For instance, to Goktas and Demirel, (2012) using ICT tools for either personal or professional purposes contributes to ICT skills as in the form of keeping blogs during which you need to use stay online and practice using ICT. Thirdly, “My self-confidence increases.” has also been reported in numerous research (Goktas & Demirel, 2012; Martinovic & Zhang, 2012; Papastergiou, 2010). A supporting evidence for the increase in self-confidence regarding ICT is demonstrated by Martinovic and Zhang (2012); in their study, self-confidence as well as ICT skills of pre-service teachers improved having used ICT in the teacher education program. According to Goktas and Demirel (2012) blogs as a commonly used ICT tool helps increase the self-confidence levels of prospective teachers.

Teacher-training technology components have been found to be a strong factor in affecting and even changing ICT SE levels of pre-service teachers (Abbitt & Klett, 2007; Tondeur et al., 2012) and it is reflected here as the provision of ITMD and CALL courses labeled as positive factors. The former course covers areas of ICT based materials development and the latter offers fourth year students hands-on teaching activities blended into theory and most recent updates in the field.

On the other hand, for the negative factors the most commonly experienced “Lack of knowledge and skills”. Ertmer and Ottenbreit-Leftwich (2010: 259) expressed the significance of teacher knowledge that directly influences the decision-making processes. Additional knowledge and skills required in today’s context includes “pedagogical technology integration content knowledge”. Teachers are expected to know about the technology, new methods enhancing student learning in the ICT settings and how to select appropriate resources to reach the learning goals. Therefore, as this study suggests “knowledge and skills” of teachers that are transferred or transformed to student learning are key indicators of success in technology integration. In line with these, for pre-service teacher education, “hands-on experiences with technology, observations of best practices of technology use, related readings and discussions as well as reflection, opportunities to practice technology use to facilitate learning (ibid, p. 266)”. Using blogs experimented by Goktas and Demirel (2012) applies here. Prospective teachers’ perceptions of the effects of blogs on ICT competencies display that students believe “blogging helped improve my knowledge and skills regarding how to use ICTs in my future profession (ibid, p. 913)”

This factor is followed by “Technical problems”. Some minor similar problems such as software or hardware related pitfalls have been reported by Martinovic and Zhang (2012) and teachers solved problems by bringing their personal laptops to the classroom as a backup plan. Several further complaints were collected from the students regarding the opportunities in the laboratory and Internet connection (Papastergiou, 2010).

Third negative factor listed “Lack of confidence” have been extensively encountered in relation to SE (Albion, 1999; Ertmer & Ottenbreit-Leftwich, 2010; Goktas & Demirel, 2012; Markauskaite, 2007). To start with, Ertmer and Ottenbreit-Leftwich (2010) further adds that, in addition to the knowledge and skills required, self-efficacy referred to as feeling self-confidence is necessary particularly for the inexperienced and prospective teachers. Hence, opportunities to practice technology use in the form of presentations or field experiences and accessing a variety of models and examples (ibid, p. 266) are some suggestions to enhance SE during the pre-service teacher education. In a similar fashion, Markauskaite (2007) reported that while trainee teachers were “quite confident” with their basic ICT skills, they were not as confident as with their advanced technical skills. A significant increase of self-confidence in this study of 2007 was regarding the use of email to communicate. Another suggestion is the use of blogging during pre-service teacher education to improve self-confidence regarding ICT (Goktas & Demirel, 2012). As an additional point, pre-service and in-service teachers (Chen, 2008) have been complaining about the time consuming character of ICT tools that is also reflected in the participant responses in this study.

As a final and comprehensive point, the findings of this study reveals correspondence to the Prospective Computer Use (PCU) domain and scale of Sang et al. (2010) applied to pre-service teachers in China. PCU, the adapted version of Computer Use Scale by van Braak (2004, as cited in Sang et al., 2010: 105) covers using

computers for future teaching practice such as making presentations using Powerpoint, doing online research, getting help from computers to shape individualized learning and communicating to teachers and classmates through emails.

CONCLUSIONS

Technology has been transformed to *teachnology* as an integral part of teaching programs requiring some essentials for the set up and implementation. As Prensky (2001:1) proposed the dichotomy of digital natives and immigrants; today's learners "think and process information differently" as natives to the digital world; therefore their interests, expectations, beliefs and practices should be evaluated within the digital context. In this direction, natives seem to be ICT self-efficacious and positive factors outnumber and outweigh the negative ones influencing their ICT use.

To sum up, believing the difference technology creates on the information processing, "the Net Generation" student teachers are expected to create that difference when it is their turn (So et al., 2012: 1234). Pre-service teachers' preparation for technology use should cover areas of systematic change efforts such as aligning theory and practice, access to resources, cooperation with/between institutions, leadership, teachers as role models, feedback, collaboration, reflection and finally authentic experiences (Tondeur et al., 2012). Additionally, these programs need to consider teacher beliefs, SE and attitude to ICT that directly influence their in-class behaviors and practices (Chen, 2008).

The answer to the question "Are the teachers with low levels of SE likely to experience more stress and early burnout?" signals the role and importance of SE for teachers of all levels and subject areas. The significance of this study lies in the fact that if the changes either at the curriculum or subject level take place following a bottom-up approach regarding what teachers are able, willing and motivated to do, there is an increased chance of success.

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